Technical Data Sheet

MM-metal oL-steelceramic

PolymerMetal for repairs and maintenance of oily, greasy or fuel contaminated metals and alloys

(Data Sheet Version 11.0 dd. 01.04.2009)

MultiMetall

the MetalExistenceCompany™

PolymerMetall® • MultiMetall® • Ceramium® • Molymetall® • Sealium® • XETEX®

Interested parties, please contact

Authorized Exclusive Distributor in Indonesia, Singapore, Malaysia, Phillipine, Brunei

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MM-metal oL-steelceramic

Product description

MM-metal oL-steelceramic is a PolymerMetal tested and certified for the repair of oily, greasy or fuel contaminated metals and alloys in case of stress due to cracks, corrosion, abrasion, impact or chemicals. The degree of soiling does not in any way affect the bonding with the structure of the soiled metal surface. High technical data and also the chemical resistance and bonding with the structure on a dirty metallic surface are remarkable features of MM-metal oL-steelceramic.

MM-metal oL-steelceramic is a two-component-product and can be either used with Hardener yellow or Hardener red. The Hardener yellow offers better technical data; the Hardener red is suitable for emergency and quick repairs or at non high-stressed repairs because of the considerably shorter curing times. Possibly after the usage of Hardener red, a second overlapping coat with Hardener yellow should be done to achieve the better technical data. A metal component with two hardener components facilitates an efficient and practise-orientated use.

MM-metal oL-steelceramic is certified by „Lloyds Register of Shipping“.

Technical data

Application consistency:	pasty
Colour after curing:	dark grey
Specific passage resistance:	5,3 x 10^{14} Ωcm
Passage resistance:	7,52 x 10^{12} Ω
Corrosion:	none
Electrochemical corrosion (DIN 50900):	none
Machinability:	with SiC-grinding plates or Diamond tools by dry cut
Cutting speed:	v_c = 60 - 125 m/min
Cutting depth:	a_p = 0,5 - 1 mm
Feed:	f = 0,1 - 0,2 mm/r

Technical data for use with Hardener yellow

Compressive strength (DIN ISO 604):	200 MPa (29000 psi)
Tensile strength:	80 MPa (11600 psi)
Bending strength (DIN 53452):	78 MPa (11310 psi)
Tensile shearing strength on steel:	31 MPa (4495 psi)
Brinell hardness (DIN 50351):	34
Linear expansion coefficient at 25-45 °C:	5,1 x 10^{-6} K
Pressure-tight up to:	300 bar (4350 psi)
Temperature resistance:	-150 °C to +280 °C
Roughness grade after use of diamond-equipped tools:	3,4 µm
Density (mixed components):	2,44 g/cm3

Technical data for use with Hardener red

Compressive strength (DIN ISO 604):	93 MPa (13485 psi)
Tensile strength:	49 MPa (7105 psi)
Bending strength (DIN 53452):	67 MPa (9715 psi)
Tensile shearing strength on steel:	19 MPa (2755 psi)
Pressure-tight up to:	100 bar (1450 psi)
Temperature resistance:	-150 °C to +120 °C
Density (mixed components):	2,12 g/cm^3

Chemical resistance

Already after curing a very good resistance is existent; highest resistance is effected after curing for approx. 6 days at approx. 21°C (alternatively for approx. 4 h at approx. 21°C followed by approx. 15 h at 35 - 40°C). The resistance to chemical stress like acids, caustic solutions, solvents, salts, gases, etc. depends on the concentration, temperature and duration of the exposure. Further details can be given on request.

Surface preparation

- All repair spots must be mechanically roughened to achieve a metallic bright surface; depending on the condition of the repair spot by blasting, cutting, grinding
- Fresh oil, grease or fuel contaminations (i.e. caused by leakages) do not need to be removed, however dirt residues like rust or paint must be removed
- Subsequent cleaning by wiping, sweeping, blowing off or exhausting

Processing data for use with Hardener yellow

Mixing ratio by:	Weight	Volume
MM-metal oL-steelceramic	20	8
Hardener yellow	1	1
Tool		Measuring spoon yellow

Temperature	Pot life	Curing
5 °C	60 min	5 days
15 °C	45 min	2 days
20 °C	30 min	24 h
25 °C	25 min	20 h
30 °C	20 min	18 h

The processing shouldn't be carried out below + 5 °C.

Processing data for use with Hardener red

Mixing ratio by:	Weight	Volume
MM-metal oL-steelceramic	5	2
Hardener red	1	1
Tool		Measuring spoon red

Temperature	Pot life	Curing
5 °C	10 min	6 h
15 °C	5 min	2,5 h
20 °C	4 min	45 min
25 °C	3,5 min	40 min
30 °C	3 min	35 min

The processing shouldn't be carried out below + 5 °C.

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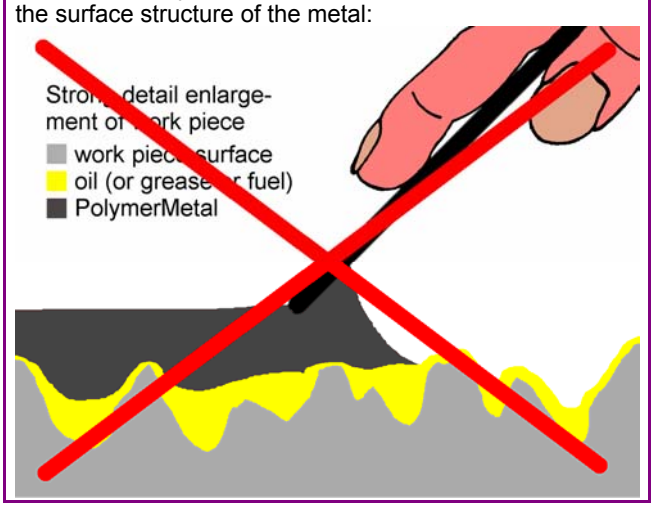
Application instruction
Before mixing the components the work piece should be prepared in accordance with the surface preparation. Always use clean tools for the removal of the components to avoid a reaction within the tins. We recommend mixing only the quantity of material which can be processed within the pot life. Especially in case of using Hardener red the curing starts very fast.

The available measuring spoons yellow (or measuring spoons red) can be used to measure the required volume parts of the components. The big measuring spoon is for the use of MM-metal oL-steelceramic, the small spoon is for Hardener yellow (or Hardener red). Spoons must be filled levelled.

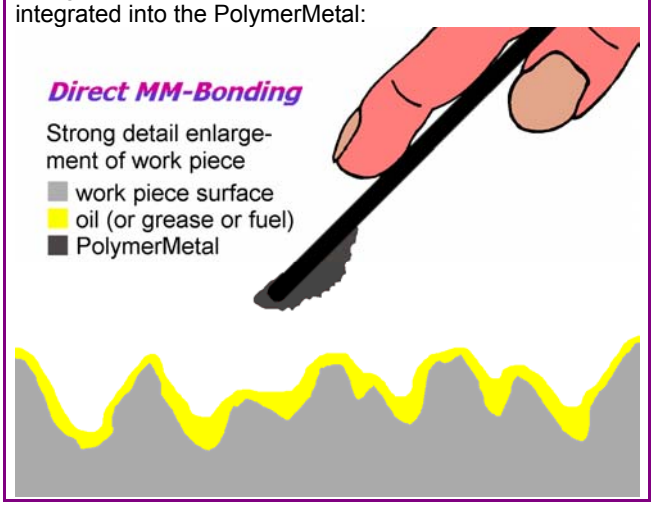
Under consideration of the mixing ratio the components must be mixed very thoroughly.

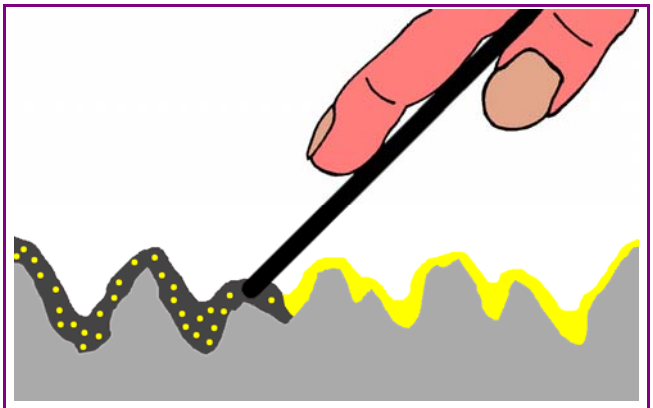
To achieve good bonding properties on the prepared metal surface, the mixture (the PolymerMetal) must penetrate all fresh oil, grease or fuel contaminations.

False! The PolymerMetal does not form a compound with the surface structure of the metal:

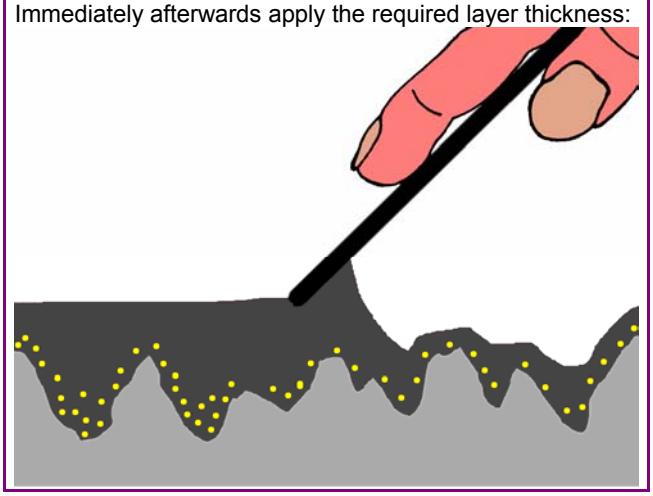


True! Apply a thin first layer of the PolymerMetal by using a spatula or any other suitable tool and rub it in with pressure in criss-cross fashion several times. Hereby fresh oil, grease or fuel contaminations are absorbed and integrated into the PolymerMetal:





Immediately afterwards apply the required layer thickness:



When pressurised systems should be sealed, the PolymerMetal must be continuously applied to the leakage and rubbed in until curing sets in. Herewith the formation of oil channels in the still soft PolymerMetal is avoided.

When sealing a leakage with Hardener red, possibly a second overlapping layer with Hardener yellow should be applied afterwards to achieve better technical data.

All used tools should be cleaned straight after use.

Multiple coating

Application of a successive layer on
MM-metal oL-steelceramic / Hardener yellow

At work piece temperature	apply successive layer after
approx. 15 - 17 °C	approx. 3 h 30 min
approx. 20 - 22 °C	approx. 90 min
approx. 28 - 30 °C	approx. 80 min

At a work piece temperature of 29 °C for example a successive layer should be applied approx. 80 min after mixing the PolymerMetal for the previous layer.

If the previous coating is already partly cured, it is obligatory to do a surface preparation again by roughening (preferably by careful light blasting) the previous coating before applying the next coating.

Application of a successive layer on
MM-metal oL-steelceramic / Hardener red

The application of a successive layer can be carried out after the previous layer has partly cured without the necessity of a surface preparation.

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Reinforcement
If Fabric tapes (glass fibre or stainless steel) are used, the fibres should be completely coated from both sides when embedded in the PolymerMetal. Several layers increase strength.

Aftercuring
The mechanical, thermal and chemical properties of MM-metal oL-steelceramic can be improved by aftercuring, when warming up the metallic substrate for approx. 2 hours at approx. 100 °C after partial curing or curing.

Working security
Avoid eye and skin contact. In case of skin contact, wash thoroughly with soap and water. In case of eye contact, rinse thoroughly with water.

Storage
Both components (MM-metal oL-steelceramic + Hardener) can be stored for at least 5 years, if kept at temperatures below 25 °C. The materials do not lose their high quality performance after repeated openings of the containers.

Order information

No.	Product	Unit
2460	MM-metal oL-steelceramic, pasty	1000 g
249	Hardener yellow, pasty	50 g
248	Hardener red, pasty	100 g
246	MM-metal oL-steelceramic, pasty	500 g
253	Hardener yellow, pasty	25 g
248	Hardener red, pasty	100 g

Economicalness	Used quantity		Area	Volume
oL-steelceramic	1000 g	1050 g	0,431 m^2	431 cm^3
Hardener yellow	50 g			
oL-steelceramic	952 g	1000 g	0,410 m^2	410 cm^3
Hardener yellow	48 g			
oL-steelceramic	2321 g	2437 g	1 m^2	1000 cm^3
Hardener yellow	116 g			

The areas were achieved at a layer thickness of 1 mm.

To process a complete 1000 g tin of MM-metal oL-steelceramic with Hardener red, 2 tins of Hardener red are required.

Economicalness	Used quantity		Area	Volume
oL-steelceramic	1000 g	1200 g	0,566 m^2	566 cm^3
Hardener red	200 g			
oL-steelceramic	833 g	1000 g	0,472 m^2	472 cm^3
Hardener red	167 g			
oL-steelceramic	1766 g	2119 g	1 m^2	1000 cm^3
Hardener red	353 g			

The areas were achieved at a layer thickness of 1 mm.

No.	Accessories	Unit
26	Measuring spoon yellow	1 set
25	Measuring spoon red	1 set
18	Fabric tape (stainless steel)	100 x 10 cm
20	Fabric tape (glass fibre)	1000 x 5 cm

MM-metal oL-steelceramic is also available in:

No.	Product	Unit
802	MM-Basic Set	1 pc
804	MM-Set oL	1 pc

Availability
Technical data sheets are generally available in German or English language. MM-metal oL-steelceramic is only produced in Germany and delivered worldwide within short time by MultiMetall. In addition to that our products are internationally available from many MultiMetall-partners. Ask for further products from MultiMetall.

Note
The product information and instructions provided in this leaflet were prepared to the best of our knowledge and serve information purposes only. We recommend that appropriate tests are carried out prior to application in order to ensure that the products and methods fulfil the purpose desired by the user. In this procedure, the given data may serve as a basis. Application and processing of the products lie outside our possible control and are therefore the sole responsibility of the user.

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